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## RAW SEQUENCE LISTING

The Biotechnology Systems Branch of the Scientific and Technical  
Information Center (STIC) no errors detected.

Application Serial Number: 10/S23, 343

Source: PCT

Date Processed by STIC: 02/21/2006

***ENTERED***

1

**CRF Errors Edited by the STIC Systems Branch**

Serial Number: 10/523,343

CRF Edit Date: 02/21/2006  
Edited by: DA

\_\_\_ **Realigned nucleic acid/amino acid numbers/text in cases where the sequence text "wrapped" to the next line**

\_\_\_ **Corrected the SEQ ID NO. Sequence numbers edited were:**

\_\_\_\_\_

\_\_\_ **Inserted or corrected a nucleic number at the end of a nucleic line. SEQ ID NO's edited:**

\_\_\_\_\_

/ Deleted: / \_\_\_ invalid beginning/end-of-file text ; \_\_\_ page numbers

\_\_\_ **Inserted mandatory headings/numeric identifiers, specifically:**

\_\_\_\_\_

\_\_\_ **Moved responses to same line as heading/numeric identifier, specifically:**

\_\_\_\_\_

\_\_\_ **Other:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Revised 09/09/2003



PCT

## RAW SEQUENCE LISTING

DATE: 02/21/2006

PATENT APPLICATION: US/10/523,343

TIME: 15:30:54

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02212006\J523343.raw

4 <110> APPLICANT: Min, Wang  
 5 Liu, Yingmei  
 7 <120> TITLE OF INVENTION: THIOREDOXIN MUTANTS AND USES THEREOF  
 10 <130> FILE REFERENCE: 21108.0021U2  
 12 <140> CURRENT APPLICATION NUMBER: 10/523,343  
 C--> 13 <141> CURRENT FILING DATE: 2005-02-01  
 15 <150> PRIOR APPLICATION NUMBER: PCT/US03/22847  
 16 <151> PRIOR FILING DATE: 2002-07-02  
 18 <150> PRIOR APPLICATION NUMBER: 60/401,073  
 19 <151> PRIOR FILING DATE: 2002-09-02  
 21 <160> NUMBER OF SEQ ID NOS: 58  
 23 <170> SOFTWARE: FastSEQ for Windows Version 4.0  
 25 <210> SEQ ID NO: 1  
 26 <211> LENGTH: 105  
 27 <212> TYPE: PRT  
 28 <213> ORGANISM: Artificial Sequence  
 30 <220> FEATURE:  
 31 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =  
 32 synthetic construct  
 34 <400> SEQUENCE: 1  
 35 Met Val Lys Gln Ile Glu Ser Lys Thr Ala Phe Gln Glu Ala Leu Asp  
 36 1 5 10 15  
 37 Ala Ala Gly Asp Lys Leu Val Val Val Asp Phe Ser Ala Thr Trp Cys  
 38 20 25 30  
 39 Gly Pro Cys Lys Met Ile Lys Pro Phe Phe His Ser Leu Ser Glu Lys  
 40 35 40 45  
 41 Tyr Ser Asn Val Ile Phe Leu Glu Val Asp Val Asp Asp Cys Gln Asp  
 42 50 55 60  
 43 Val Ala Ser Glu Cys Glu Val Lys Cys Met Pro Thr Phe Gln Phe Phe  
 44 65 70 75 80  
 45 Lys Lys Gly Gln Lys Val Gly Glu Phe Ser Gly Ala Asn Lys Glu Lys  
 46 85 90 95  
 47 Leu Glu Ala Thr Ile Asn Glu Leu Val  
 48 100 105  
 50 <210> SEQ ID NO: 2  
 51 <211> LENGTH: 105  
 52 <212> TYPE: PRT  
 53 <213> ORGANISM: Artificial Sequence  
 55 <220> FEATURE:  
 56 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =  
 57 synthetic construct  
 59 <400> SEQUENCE: 2  
 60 Met Val Lys Gln Ile Glu Ser Lys Thr Ala Phe Gln Glu Ala Leu Asp

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```

61 1 5 10 15
62 Ala Ala Gly Asp Lys Leu Val Val Val Asp Phe Ser Ala Thr Trp Ser
63 20 25 30
64 Gly Pro Cys Lys Met Ile Lys Pro Phe Phe His Ser Leu Ser Glu Lys
65 35 40 45
66 Tyr Ser Asn Val Ile Phe Leu Glu Val Asp Val Asp Asp Cys Gln Asp
67 50 55 60
69 Val Ala Ser Glu Cys Glu Val Lys Cys Met Pro Thr Phe Gln Phe Phe
70 65 70 75 80
71 Lys Lys Gly Gln Lys Val Gly Glu Phe Ser Gly Ala Asn Lys Glu Lys
72 85 90 95
73 Leu Glu Ala Thr Ile Asn Glu Leu Val
74 100 105
76 <210> SEQ ID NO: 3
77 <211> LENGTH: 105
78 <212> TYPE: PRT
79 <213> ORGANISM: Artificial Sequence
81 <220> FEATURE:
82 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
83 synthetic construct
85 <400> SEQUENCE: 3
86 Met Val Lys Gln Ile Glu Ser Lys Thr Ala Phe Gln Glu Ala Leu Asp
87 1 5 10 15
88 Ala Ala Gly Asp Lys Leu Val Val Val Asp Phe Ser Ala Thr Trp Cys
89 20 25 30
90 Gly Pro Ser Lys Met Ile Lys Pro Phe Phe His Ser Leu Ser Glu Lys
91 35 40 45
92 Tyr Ser Asn Val Ile Phe Leu Glu Val Asp Val Asp Asp Cys Gln Asp
93 50 55 60
94 Val Ala Ser Glu Cys Glu Val Lys Cys Met Pro Thr Phe Gln Phe Phe
95 65 70 75 80
96 Lys Lys Gly Gln Lys Val Gly Glu Phe Ser Gly Ala Asn Lys Glu Lys
97 85 90 95
98 Leu Glu Ala Thr Ile Asn Glu Leu Val
99 100 105
101 <210> SEQ ID NO: 4
102 <211> LENGTH: 318
103 <212> TYPE: DNA
104 <213> ORGANISM: Artificial Sequence
106 <220> FEATURE:
107 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
108 synthetic construct
110 <400> SEQUENCE: 4
111 atggtgaagc agatcgagag caagactgct tttcaggaag ccttggacgc tgcaggtgat 60
112 aaacttgtag tagttgactt ctcagccacg tgggtgtgggc cttgcaaaat gatcaagcct 120
113 ttcttttcatt cctctctga aaagtattcc aacgtgatat tccttgaagt agatgtggat 180
114 gactgtcagg atgttgcttc agagtgtgaa gtcaaata tgcacacatt ccagtttttt 240
115 aagaagggac aaaaggtggg tgaattttct ggagccaata aggaaaagct tgaagccacc 300
116 attaatgaat tagtctaa 318

```

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Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02212006\J523343.raw

```

118 <210> SEQ ID NO: 5
119 <211> LENGTH: 318
120 <212> TYPE: DNA
121 <213> ORGANISM: Artificial Sequence
123 <220> FEATURE:
124 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
125     synthetic construct
128 <400> SEQUENCE: 5
129 atggtgaagc agatcgagag caagactgct tttcaggaag ccttggacgc tgcaggtgat      60
130 aaacttgtag tagttgactt ctcagccacg tggcgtgggc cttgcaaaat gatcaagcct      120
131 ttctttcatt ccctctctga aaagtattcc aacgtgatat tccttgaagt agatgtggat      180
132 gactgtcagg atgttgcttc agagtgtgaa gtcaaataca tgccaacatt ccagtttttt      240
133 aagaagggac aaaaggtggg tgaattttct ggagccaata aggaaaagct tgaagccacc      300
134 attaataaat tagtctaa                                     318
136 <210> SEQ ID NO: 6
137 <211> LENGTH: 318
138 <212> TYPE: DNA
139 <213> ORGANISM: Artificial Sequence
141 <220> FEATURE:
142 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
143     synthetic construct
145 <400> SEQUENCE: 6
146 atggtgaagc agatcgagag caagactgct tttcaggaag ccttggacgc tgcaggtgat      60
147 aaacttgtag tagttgactt ctcagccacg tggcgtgggc ctcgcaaaat gatcaagcct      120
148 ttctttcatt ccctctctga aaagtattcc aacgtgatat tccttgaagt agatgtggat      180
149 gactgtcagg atgttgcttc agagtgtgaa gtcaaataca tgccaacatt ccagtttttt      240
150 aagaagggac aaaaggtggg tgaattttct ggagccaata aggaaaagct tgaagccacc      300
151 attaataaat tagtctaa                                     318
153 <210> SEQ ID NO: 7
154 <211> LENGTH: 24
155 <212> TYPE: DNA
156 <213> ORGANISM: Artificial Sequence
158 <220> FEATURE:
159 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
160     synthetic construct
162 <400> SEQUENCE: 7
163 aagcttatgg tgaagcagat cgag                                     24
165 <210> SEQ ID NO: 8
166 <211> LENGTH: 24
167 <212> TYPE: DNA
168 <213> ORGANISM: Artificial Sequence
170 <220> FEATURE:
171 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
172     synthetic construct
174 <400> SEQUENCE: 8
175 ctcgagttag actaatcat taat                                     24
177 <210> SEQ ID NO: 9
178 <211> LENGTH: 165
179 <212> TYPE: PRT

```

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```

180 <213> ORGANISM: Artificial Sequence
182 <220> FEATURE:
183 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
184     synthetic construct
186 <400> SEQUENCE: 9
187 Met Ala Gln Arg Leu Leu Leu Arg Arg Phe Leu Ala Ser Val Ile Ser
188   1      5      10      15
189 Arg Lys Pro Ser Gln Gly Gln Trp Pro Pro Leu Thr Ser Arg Ala Leu
190      20      25      30
191 Gln Thr Pro Gln Cys Ser Pro Gly Gly Leu Thr Val Thr Pro Asn Pro
192      35      40      45
193 Ala Arg Thr Ile Tyr Thr Thr Arg Ile Ser Leu Thr Thr Phe Asn Ile
194      50      55      60
195 Gln Asp Gly Pro Asp Phe Gln Asp Arg Val Val Asn Ser Glu Thr Pro
196 65      70      75      80
197 Val Val Val Asp Phe His Ala Gln Trp Cys Gly Pro Cys Lys Ile Leu
198      85      90      95
199 Gly Pro Arg Leu Glu Met Val Ala Lys Gln His Gly Lys Val Val Met
200      100     105     110
201 Ala Lys Val Asp Ile Asp Asp His Thr Asp Leu Ala Ile Glu Tyr Glu
202      115     120     125
203 Val Ser Ala Val Pro Thr Val Leu Ala Met Lys Asn Gly Asp Val Val
204      130     135     140
205 Asp Lys Phe Val Gly Ile Lys Asp Glu Asp Gln Leu Glu Ala Phe Leu
206 145     150     155     160
207 Lys Lys Leu Ile Gly
208      165
210 <210> SEQ ID NO: 10
211 <211> LENGTH: 165
212 <212> TYPE: PRT
213 <213> ORGANISM: Artificial Sequence
215 <220> FEATURE:
216 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
217     synthetic construct
219 <400> SEQUENCE: 10
220 Met Ala Gln Arg Leu Leu Leu Arg Arg Phe Leu Ala Ser Val Ile Ser
221   1      5      10      15
222 Arg Lys Pro Ser Gln Gly Gln Trp Pro Pro Leu Thr Ser Arg Ala Leu
223      20      25      30
224 Gln Thr Pro Gln Cys Ser Pro Gly Gly Leu Thr Val Thr Pro Asn Pro
225      35      40      45
226 Ala Arg Thr Ile Tyr Thr Thr Arg Ile Ser Leu Thr Thr Phe Asn Ile
227      50      55      60
228 Gln Asp Gly Pro Asp Phe Gln Asp Arg Val Val Asn Ser Glu Thr Pro
229 65      70      75      80
230 Val Val Val Asp Phe His Ala Gln Trp Ser Gly Pro Cys Lys Ile Leu
231      85      90      95
232 Gly Pro Arg Leu Glu Met Val Ala Lys Gln His Gly Lys Val Val Met
233      100     105     110

```

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Input Set : A:\PTO.DA.txt

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```

234 Ala Lys Val Asp Ile Asp Asp His Thr Asp Leu Ala Ile Glu Tyr Glu
235      115      120      125
236 Val Ser Ala Val Pro Thr Val Leu Ala Met Lys Asn Gly Asp Val Val
237      130      135      140
238 Asp Lys Phe Val Gly Ile Lys Asp Glu Asp Gln Leu Glu Ala Phe Leu
239 145      150      155      160
240 Lys Lys Leu Ile Gly
241      165
243 <210> SEQ ID NO: 11
244 <211> LENGTH: 165
245 <212> TYPE: PRT
246 <213> ORGANISM: Artificial Sequence
248 <220> FEATURE:
249 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
250     synthetic construct
252 <400> SEQUENCE: 11
253 Met Ala Gln Arg Leu Leu Leu Arg Arg Phe Leu Ala Ser Val Ile Ser
254 1      5      10      15
255 Arg Lys Pro Ser Gln Gly Gln Trp Pro Pro Leu Thr Ser Arg Ala Leu
256      20      25      30
257 Gln Thr Pro Gln Cys Ser Pro Gly Gly Leu Thr Val Thr Pro Asn Pro
258      35      40      45
259 Ala Arg Thr Ile Tyr Thr Thr Arg Ile Ser Leu Thr Thr Phe Asn Ile
260      50      55      60
261 Gln Asp Gly Pro Asp Phe Gln Asp Arg Val Val Asn Ser Glu Thr Pro
262 65      70      75      80
263 Val Val Val Asp Phe His Ala Gln Trp Cys Gly Pro Ser Lys Ile Leu
264      85      90      95
265 Gly Pro Arg Leu Glu Met Val Ala Lys Gln His Gly Lys Val Val Met
266      100     105     110
267 Ala Lys Val Asp Ile Asp Asp His Thr Asp Leu Ala Ile Glu Tyr Glu
268      115     120     125
269 Val Ser Ala Val Pro Thr Val Leu Ala Met Lys Asn Gly Asp Val Val
270      130     135     140
271 Asp Lys Phe Val Gly Ile Lys Asp Glu Asp Gln Leu Glu Ala Phe Leu
272 145     150     155     160
273 Lys Lys Leu Ile Gly
274      165
276 <210> SEQ ID NO: 12
277 <211> LENGTH: 502
278 <212> TYPE: DNA
279 <213> ORGANISM: Artificial Sequence
281 <220> FEATURE:
282 <223> OTHER INFORMATION: Description of Artificial Sequence:/note =
283     synthetic construct
285 <400> SEQUENCE: 12
286 atggctcagc gacttcttct gaggaggttc ctggcctctg tcatctccag gaagccctct      60
287 cagggtcagt ggccaccctt cacttccaga gccctgcaga cccacaatg cagtctggt      120
288 ggctgactg taacacccaa cccagcccg acaatatata ccacgaggat ctcttgaca      180

```

RAW SEQUENCE LISTING ERROR SUMMARY

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Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:16; Xaa Pos. 1

Seq#:17; Xaa Pos. 4

**VERIFICATION SUMMARY**

PATENT APPLICATION: US/10/523,343

DATE: 02/21/2006

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Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02212006\J523343.raw

L:13 M:271 C: Current Filing Date differs, Replaced Current Filing Date  
L:358 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:362 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:16  
L:363 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:16 after pos.:0  
L:375 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:379 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:17  
L:380 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:17 after pos.:0  
L:468 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:471 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:22  
L:483 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:486 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:23  
L:498 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:501 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:24